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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,171	06/21/2001	Yang-lim Choi	Q64026	4000

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EXAMINER

SAJOUS, WESNER

ART UNIT PAPER NUMBER

2676

DATE MAILED: 06/25/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/885,171

Applicant(s)

CHOI ET AL.

Examiner

Wesner Sajous

Art Unit

2676

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-19 is/are allowed.
- 6) ☒ Claim(s) 1,2 and 10 is/are rejected.
- 7) ☒ Claim(s) 3-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Inui et al. (JP401245371).

Considering claim 1, Inui discloses a shape descriptor extracting method (70, fig. 4) comprising: extracting a skeleton of an image (*e.g., via the skeletonizing means, see line 4 of page 1*) and determining a shape descriptor based on the extracted skeleton (*e.g., by means of the feature information applying means. See "Constitution": lines 1-12 at page 1.*)

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inui in view of Naoi (US6005976).

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Considering claim 2, Inui discloses a shape descriptor extracting method (see fig. 4, item 70) that extracts a skeleton from an input image (e.g., the image stored in storage device 64). See "Constitution": lines 1-12 at page 1.

It is noted that Inui fails to teach obtaining a first list of straight lines by connecting pixels based on the extracted skeleton and determining a second list of straights obtained by normalizing the first list of straight lines.

Naoi, in a similar art, teaches the concept and equivalence for obtaining a first list of straight lines by connecting pixels (e.g., *the extracted partial patterns symbols from the image formed by straight line portions, see col. 2, line 66 to col. 3, line 20*) based on the extracted skeleton (*see also col. 14, lines 47-49*) and determining a second list of straights obtained by normalizing the first list of straight lines (*see col. 5, lines 3-25, wherein the second list of straight lines corresponds with the detected straight lines from the partial patterns which then forms the frame based on intervals of candidates of the straight lines, as performed by the straight lines extracting parts 2, 3, and 4. See also col. 8, lines 5-28*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the shape describing device 70 of Inui to include the concept pertinent to obtaining a first list of straight lines by connecting pixels based on the extracted skeleton and determining a second list of straights obtained by normalizing the first list of straight lines, as taught by Naoi's figs. 5 and 6. The modification would have been for the purpose of positively extracting a straight line

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which is uneven, and to accurately extract the frames even when the block frame is inclined. See Naoi's col. 5, lines 1-2, and lines 25-27.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inui and Naoi as applied to claim 2 above, and further in view of Hsu (US6151424).

Regarding claim 10, Inui and Naoi render obvious most claimed features of the invention as applied to claim 2 above, but they fail to teach the input image is a binary image.

Hsu teaches using binary images as input. See col. 20, lines 25-27.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the features of Inui and Naoi to include a binary image as input, as taught by Hsu. The modification would have been for the purpose of performing object recognition using shape information. See Hsu's col. 20, lines 20-21.

#### ***Allowable Subject Matter***

6. Claims 15-19 are allowed because the prior art of record fail to teach or suggest an image searching method for searching for images having similar shapes to a query image and a dissimilarity measuring method for measuring dissimilarity between images indexed using a shape descriptor formed on the basis of a skeleton, wherein both methods comprising the step of comparing a list of straight lines from a shape descriptor of a detected image with the list of straight lines of a shape descriptor of a query image, and obtaining dissimilarity.

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7. Claims 3-9, and 11-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, because the prior art of record fail to teach or suggest a shape descriptor extracting method comprises the step of extracting the skeleton from a distance map obtained by performing a distance transform on the input image; extracting the second list of straight lines by connecting respective pixels within extracted thinning skeleton; and determining the second list of straight lines, obtained by normalizing the first list of straight lines based on the maximum distance between ending points of respective straight lines, as the shape descriptor.

### **Conclusion**

**Any response to this action should be mailed to:**

**Box**

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Washington, DC 20231

**Or faxed to:**

(703) 308-9051, (for formal communications; please mark "EXPEDITED  
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**Or:**

(703) 872-9314 (**for technology center 2600 only**)

Hand-held delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,

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Arlington, VA, 6th floor (receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesner Sajous whose telephone number is (703) 308-5857. The examiner can be reached on Mondays thru Thursdays and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (703) 308-6829. The fax phone number for this group is (703) 308-6606.

*Wesner Sajous - WOS*  
*WOS*  
6/12/2003